ARBORICULTURAL IMPACT ASSESSMENT

The Tunnel House,
Coates

September 2021

Barton Hyett Associates
Arboricultural Consultants

Summary table		
Site Name:	The Tunnel House, Coates	
Project reference:	4297	
Site Address:	Tarlton Road, Coates	
Nearest Postcode:	GL7 6PW	
Central Grid reference:	SO 96570 00590	
Local Planning Authority:	Cotswold District Council	
Relevant planning policies:	Cotswold District Council Local Plan (2011 to 2031): Policy EN7 - Trees, Hedgerows and Woodlands	
Statutory Controls:	Tree Preservation Order	Conservation Area
	No	Yes
Soil Type: (Source: BGS online soils map © NERC 2021)	Superficial/Drift	Bedrock
	Deep clayey loam to sandy loam	Forest Marble Formation - Limestone
Topographical Survey:	S2338 (January 2021)	
Site Layout:	Overall Site Plan F/215 Rev.A	
Notes:	None.	
Report author:	Ian Monger *MSc, BSc (Hons), TechCert (ArborA) MArborA*	
Date of issue:	03.09.2021	

Arboricultural Association Professional Member
PR179

Institute of Chartered Foresters registered

Barton Hyett Arboricultural Consultants

REPORT CONTENTS:

1. INSTRUCTION

1.1. I am Ian Monger. I am an arboriculturist with 16 years of experience, and a professional member of the Arboricultural Association.

1.2. Barton Hyett Associates Ltd have been instructed by The Bathurst Estate to survey trees located at The Tunnel House, Coates ('the site') in accordance with the recommendations of British Standard 5837:2012 '*Trees in relation to design, demolition and construction - recommendations*'.

1.3. The scope of the instruction was to inspect trees relevant to a planning application at the site and provide written advice on how they inform feasibility and design options for the site. The instruction also required an assessment of the potential impact (the arboricultural impact assessment) of the proposed development on the site's arboricultural resource to be undertaken.

2. SITE DESCRIPTION

2.1. The site is a linear woodland belt growing on an embankment along the west side of the Thames and Severn Canal. The embankment runs south from the Coates Portal of the Sapperton Tunnel and was created when the tunnel and canal were excavated. The tunnel was completed in 1789, remained in use until the early 1900s and was abandoned in 1927.

2.2. The embankment on which the woodland grows is made of the spoil of the canal and tunnel building excavations. The woodland is approximately 45 metres wide and is of predominately mature common beech.

2.3. To the north-west of the Coates Portal is The Tunnel House, an inn which is currently closed to business, with car park, garden and detached single-storey outbuilding.

2.4. The woodland borders and overlooks a pasture field to the immediate west. A mostly-derelict dry stone wall forms part of the boundary between the woodland and the field.

2.5. The site and Tunnel House are accessed along a private gated road from Tarlton Road to the south. A separate agricultural access from Tarlton Road leads directly into the field to the west of the woodland.

2.6. The Wysis Way national trail follows the canal towpath along the east edge of the embankment woodland.

3. TREE SURVEY FINDINGS

3.1. A total of 75 trees, groups of trees, woodland and hedgerows were surveyed. These are summarised in terms of their quality in accordance with the recommendations of BS5837 below, and shown in more detail on the Tree Survey and Constraints Plan (Section 2) and within the Tree Survey Schedule (Section 3).

	Total	A - High quality trees whose retention is most desirable.	B - Moderate quality trees whose retention is desirable.	C - Low quality trees which could be retained but should not significantly constrain the proposal.	U - Very poor quality trees that should be removed unless they have high conservation value.
Trees	**70**	-	66	3	1
Groups	**2**	-	2	-	-
Hedgerows	**2**	-	2	-	-
Woodlands	**1**	-	1	-	-
Total	**75**	**-**	**71**	**3**	**1**

Table 1: Summary of arboricultural features of each BS5837 quality category

4. KEY ARBORICULTURAL FEATURES

4.1. The site is not ancient woodland. No veteran, ancient or high-quality trees were identified in the survey.

4.2. At the time of my survey visit, almost all common ash trees within the woodland had been recently fellec response to Ash Dieback disease. The recent work has left the woodland as predominantly common beecl with an understorey of hazel, wych elm and hawthorn. Much of the understorey within the woodland belt ha also been coppiced for felling access, but will naturally regenerate.

4.3. There are occasional downy birch and English oak trees. The large white beam T63 (B1) is of note because of its size.

5. DEVELOPMENT PROPOSAL

5.1. The development proposal is for six new self-contained en-suite holiday rooms situated within the woodlan and accessed via woodland boardwalks. Each unit will have electricity and water supply, with a treatment plant and soak-away. The proposed site layout is shown on the Overall Site Plan F/215 Rev.A.

6. IMPACT ASSESSMENT

6.1. The recent ash felling and undergrowth clearance work has been carried out in accordance wi forestry practice and has left the woodland with good spaces for the holiday rooms and walkway between the trees and so that the need for additional tree felling is reduced to a minimum.

6.2. Only two individual trees, T36a and T40 (B2), are proposed to for removal because they fall wi structure footprints. They are shown on the Tree Retention and Removal Plan in Section 3, and their remova would have a negligible impact.

6.3. Hazel and hawthorn as well as young trees within G2 will also need to be selectively coppiced so that viev can be provided for units 3 and 4. The coppice regrowth of the stumps will provide valuable understorey an habitat niches.

6.4. Selected lower branches of retained trees will also need to be removed ('crown-lifted') to provide attract views to the field beyond but without diminishing the unique 'treehouse' sense that the design

achieve. Decisions on the pruning and coppicing work would need to be made once the building footprints, at least, have been marked-out on site, or even as part of the final landscaping considerations. A detailed specification for this pruning/coppicing can be provided within an Arboricultural Method Statement (AMS) for approval. The management of these views is also likely to require a degree of future intervention as trees and understorey grow so that the unique setting can be maintained.

6.5. Two common beech trees, T44 and T54 (C1), were noted to have the decay fungus *Kretzschmaria deusta* present. The prolonged development of decay by this fungus can lead to catastrophic brittle fracture. However, the fungus on both trees appears to be associated with wounds, and so may be acting saprotrophically on the dead/dysfunctional wood at this stage. Investigation into the remaining wood strength should be carried out - certainly before the target value/frequency (structures, visitors) within falling distance of the trees is increased. More generally, trees within the woodland should be the subject of a proactive inspection and risk management regime when the use of the woodland is increased for the site's intended use.

6.6. The buildings and boardwalks have been designed and located so that no ground level changes will be needed within the woodland. The approach to construction is that all materials will be hand-lifted to each construction location, and so there will be no need for heavy construction equipment within the woodland.

6.7. The boardwalks will be secured to the existing ground level with Easy Pad or similar fixtures, as shown on the separate Proposed Boardwalk Example Detail plan F/613. The system will allow the height of the boardwalk to be varied to provide acceptable walkway gradients without the need to alter the ground level below. Where this approach leaves the boardwalk level significantly above existing levels, handrails and new shrub planting will provide a safe and comfortable route.

6.8. The foundations for the new buildings will be screw-pile fixtures as shown on the separate Screwpile Foundation Example Detail plan F/614. The screw-piles are installed manually to a depth depending on local ground conditions and require no additional excavation. Their use will mean negligible impact on nearby tree root systems and no ground compaction or alteration of soil water movement.

6.9. New water and electricity connections will be provided within the each building without excavation into the ground. Instead they will be installed above ground and appropriately protected and covered.

6.10. The waste treatment plant and drainage field (shown as hatched areas to the west of T35/T41) will be located within the field and outside of the RPAs of trees. Foul connections from each building to the treatment plant will be installed above ground using unobtrusive pipework, which is likely to be in traditional materials. The pipes will be further blended into the landscape with new shrub planting around them. This will avoid the need for excavations except only very minor anchoring of brackets to secure the pipes.

6.11. In terms of protection of the retained trees during construction, it is clear to me that the installation of the buildings and services will be well-resourced and carried out with a high regard for the importance of the trees to the overall design. Given the types of foundations that will be used and the the hand delivery of materials to each construction area, tree protection measures need not be overly burdensome. If the boardwalk is installed first it can be used as the main construction access, both from the car park area to the north and from the field access at the south end of the site. This would provide the most level and stable access in any case. In my opinion, the use of hazard netting or similar, located in strategic locations to lir movement away from the most sensitive areas, will provide sufficient protection for the trees. T include protection of the woodland edge during excavations for the treatment plant and drainage fi pre-commencement site will determine whether any alternative access routes are preferable, and where alternative route is agreed to be acceptable, additional temporary ground protection can be provided.

6.12. The Landscape Plan includes new tree, shrub and herbaceous planting to enhance the coppice growth th will regenerate now that the forestry work has been completed. Within the woodland, new shade-tolle underplanting of shrubs and hazel coppice will provide screening and a sense of seclusion. At the woodlan edge, new groups of mixed native trees and shrubs will extend the edge habitat and soften views into out of the woodland, and the existing hedgerow at the woodland edge will be reinforced and lig shaped. With the enhanced meadow planting within the edge of the field, the new planting can significar enhance the biodiversity of the woodland as a whole.

6.13. The proposal is feasible from an arboricultural perspective, and if carefully implemented according approved Arboricultural Method Statement there would be a negligible negative impact on the re trees. A draft Tree Protection Plan is included in section 3.

7. HEADS OF TERMS FOR AN ARBORICULTURAL METHOD STATEMENT (AMS)

7.1. BS5837:2012 (Figure 1) recommends that detailed/technical design of tree protection and arboricu methodologies should be resolved and finalised following on from the approval of the feasibility of a schem by the Local Planning Authority.

7.2. Annex B and Table B.1 of BS5837:2012, an informative, advises that arboricultural method statement heac of terms are a sufficient level of information in order to deliver tree-related information into the pl system. The table also advises that a detailed arboricultural method statement might reasonably be required as a 'reserved matter' or planning condition.

7.3. In relation to the site, it is anticipated that arboricultural working methods are lik straightforward. A brief summary of the principles of tree protection on development sites is inclu section 7. A draft, 'heads of terms' for an arboricultural method statement is set out below:

- Project arboriculturist –schedule of monitoring and supervision
- Pre commencement site meeting - marked-out building footprints and boardwalk/services routes, si access, working methods, tree protection principles and measures
- Tree removals and facilitation pruning
- Erection of tree protection barriers and temporary ground protection as may be required
- Service installations
- Foundation system installations and tree roots
- Main construction phase
- Removal of tree protection barriers
- Final landscaping including tree and shrub planting.

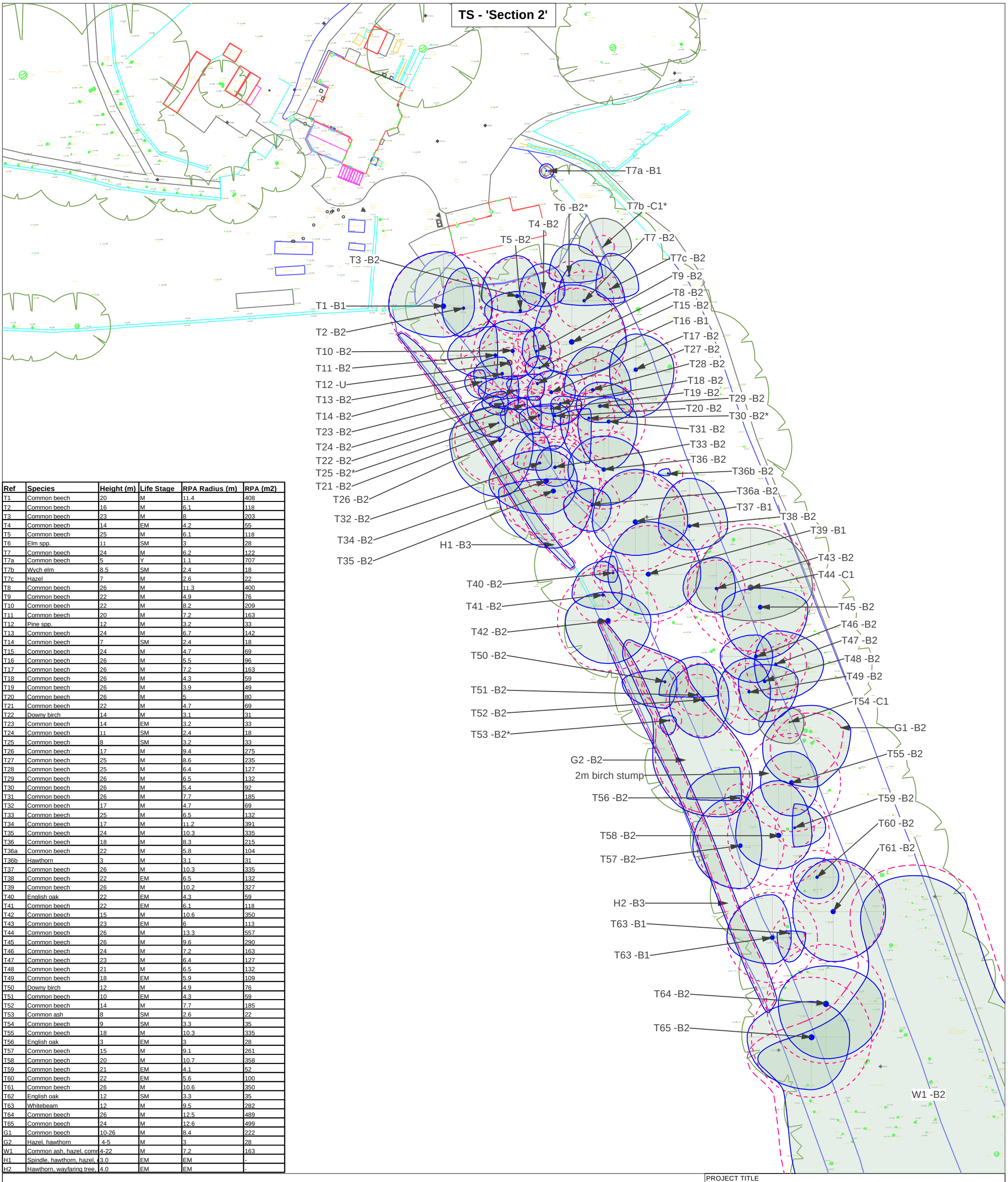
8. RECOMMENDATION AND SUMMARY

8.1. Subject to the implementation of the advice contained within this report the proposed development is acceptable from an arboricultural perspective. Retained trees can be adequately protected during construction activities to sustain their health and longevity.

8.2. An Arboricultural Method Statement and finalised Tree Protection Plan will need to be produced. Where the feasibility of a scheme has been agreed by the Local Planning Authority, this detail can be agreed and submitted at a later in accordance with a pre-commencement planning condition (by agreement with the applicant).

[redacted]

Ian Monger *BSc (Hons.), MArborA,*
Senior arboriculturist



Ref	Species	Height (m)	Life Stage	RPA Radius (m)	RPA (m2)
T1	Common beech	20	M	11.4	408
T2	Common beech	16	M	6.1	118
T3	Common beech	23	M	8	203
T4	Common beech	14	EM	4.2	55
T5	Common beech	25	M	6.1	118
T6	Elm spp.	11	SM	3	28
T7	Common beech	24	M	6.2	122
T7a	Common beech	5	Y	1.1	707
T7b	Wych elm	8.5	SM	2.4	18
T7c	Hazel	7	M	2.6	22
T8	Common beech	26	M	11.3	400
T9	Common beech	22	M	4.9	76
T10	Common beech	22	M	8.2	209
T11	Common beech	20	M	7.2	163
T12	Pine spp.	12	M	3.2	33
T13	Common beech	24	M	6.7	142
T14	Common beech	7	SM	2.4	18
T15	Common beech	24	M	4.7	69
T16	Common beech	26	M	5.5	96
T17	Common beech	26	M	7.2	163
T18	Common beech	26	M	4.3	59
T19	Common beech	26	M	3.9	49
T20	Common beech	26	M	5	80
T21	Common beech	22	M	4.7	69
T22	Downy birch	14	M	3.1	31
T23	Common beech	14	EM	3.2	33
T24	Common beech	11	SM	2.4	18
T25	Common beech	8	SM	3.2	33
T26	Common beech	17	M	9.4	275
T27	Common beech	25	M	8.6	235
T28	Common beech	25	M	6.4	127
T29	Common beech	26	M	6.5	132
T30	Common beech	26	M	5.4	92
T31	Common beech	26	M	7.7	185
T32	Common beech	17	M	4.7	69
T33	Common beech	25	M	6.5	132
T34	Common beech	17	M	11.2	391
T35	Common beech	24	M	10.3	335
T36	Common beech	18	M	8.3	215
T36a	Common beech	22	M	5.8	104
T36b	Hawthorn	3	M	3.1	31
T37	Common beech	26	M	10.3	335
T38	Common beech	22	EM	6.5	132
T39	Common beech	26	M	10.2	327
T40	English oak	22	EM	4.3	59
T41	Common beech	22	EM	6.1	118
T42	Common beech	15	M	10.6	350
T43	Common beech	23	EM	6	113
T44	Common beech	26	M	13.3	557
T45	Common beech	26	M	9.6	290
T46	Common beech	24	M	7.2	163
T47	Common beech	23	M	6.4	127
T48	Common beech	21	M	6.5	132
T49	Common beech	18	EM	5.9	109
T50	Downy birch	12	M	4.9	76
T51	Common beech	10	EM	4.3	59
T52	Common beech	14	M	7.7	185
T53	Common ash	8	SM	2.6	22
T54	Common beech	9	SM	3.3	35
T55	Common beech	18	M	10.3	335
T56	English oak	3	EM	3	28
T57	Common beech	15	M	9.1	261
T58	Common beech	20	M	10.7	358
T59	Common beech	21	EM	4.1	52
T60	Common beech	22	EM	5.6	100
T61	Common beech	26	M	10.6	350
T62	English oak	12	SM	3.3	35
T63	Whitebeam	12	M	9.5	282
T64	Common beech	26	M	12.5	489
T65	Common beech	24	M	12.6	499
G1	Common beech	10-26	M	8.4	222
G2	Hazel, hawthorn	4-5	M	3	28
W1	Common ash, hazel, comn	4-22	M	7.2	163
H1	Spindle, hawthorn, hazel,	3.0	EM	EM	-
H2	Hawthorn, wayfaring tree,	4.0	EM	EM	-

KEY

- Category A Tree - High quality (Retention highly desirable)
- Category A - Hedgerow, Group, Woodland - High quality (Retention highly desirable)
- Category B Tree - Moderate quality (Retention desirable)
- Category B - Hedgerow, Group, Woodland - Moderate quality (Retention desirable)
- Category C Tree - Low quality (May be retained but should not constrain development)
- Category C - Hedgerow, Group, Woodland - Low quality (May be retained but should not constrain development)
- Category U Tree - Very low quality (Mostly unsuitable for retention)
- Category U - Hedgerow, Group, Woodland - Very low quality (Mostly unsuitable for retention)
- Root Protection Area (RPA) - Layout design tool indicating the minimum area around a tree deemed to contain sufficient roots and soil volume to maintain the tree's viability
- Shrub mass/offsite tree/out of scope (OOS)

N
GRID NORTH

0 5 10 15 20 25
Meters

Note: The original of this drawing was produced in colour – a monochrome copy should not be relied upon. This drawing should be interpreted with reference to the accompanying tree schedule and written advice

PROJECT TITLE
The Tunnel House, Tarlton Road, Coates

DRAWING TITLE
Tree Survey & Constraints Plan

SCALE	DRAWING NUMBER
1:750 @ A3	BHA_1088_01

DRAWN BY	APPROVED BY	REVISION	SHEET	DATE
DV	IM	-	-	23/03/2021

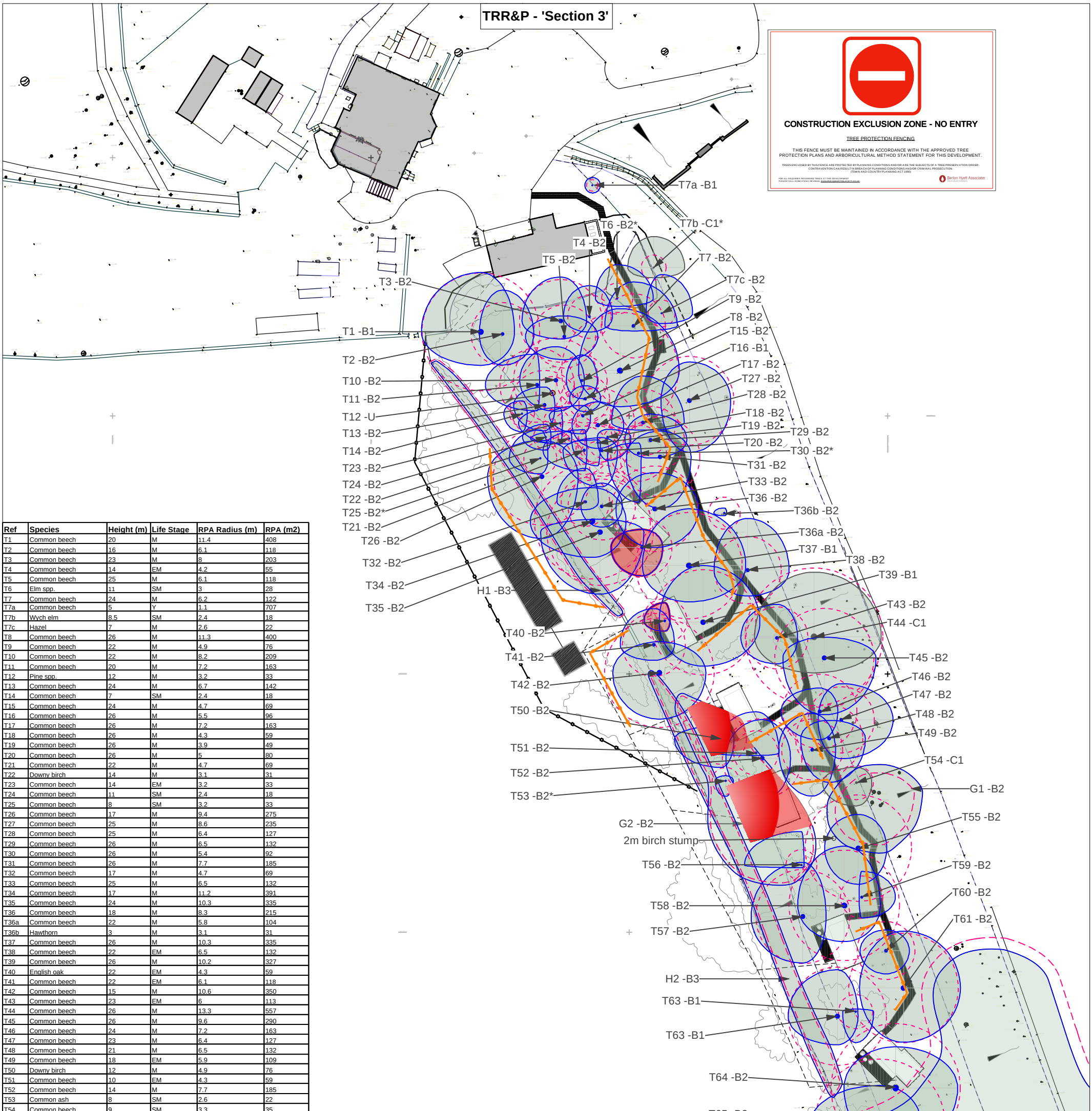
LAYOUT USED WITHIN DRAWING **XXXXXXXXX**

CLIENT **Bathurst Estate**

COORDINATE SYSTEM / DATUM **British National Grid / Newlyn Datum (AOD)**

Barton Hyett Associates
Arboricultural Consultants
Tel: 01386 576161 Website: www.barton-hyett.co.uk
Address: Barn 2,Oxpens Farm,Yanworth,
Cheltenham,Gloucestershire,GL54 3QE

TRR&P - 'Section 3'



Ref	Species	Height (m)	Life Stage	RPA Radius (m)	RPA (m2)
T1	Common beech	20	M	11.4	408
T2	Common beech	16	M	6.1	118
T3	Common beech	23	M	8	203
T4	Common beech	14	EM	4.2	55
T5	Common beech	25	M	6.1	118
T6	Elm spp.	11	SM	3	28
T7	Common beech	24	M	6.2	122
T7a	Common beech	5	Y	1.1	707
T7b	Wych elm	8.5	SM	2.4	18
T7c	Hazel	7	M	2.6	22
T8	Common beech	26	M	11.3	400
T9	Common beech	22	M	4.9	76
T10	Common beech	22	M	8.2	209
T11	Common beech	20	M	7.2	163
T12	Pine spp.	12	M	3.2	33
T13	Common beech	24	M	6.7	142
T14	Common beech	7	SM	2.4	18
T15	Common beech	24	M	4.7	69
T16	Common beech	26	M	5.5	96
T17	Common beech	26	M	7.2	163
T18	Common beech	26	M	4.3	59
T19	Common beech	26	M	3.9	49
T20	Common beech	26	M	5	80
T21	Common beech	22	M	4.7	69
T22	Downy birch	14	M	3.1	31
T23	Common beech	14	EM	3.2	33
T24	Common beech	11	SM	2.4	18
T25	Common beech	8	SM	3.2	33
T26	Common beech	17	M	9.4	275
T27	Common beech	25	M	8.6	235
T28	Common beech	25	M	6.4	127
T29	Common beech	26	M	6.5	132
T30	Common beech	26	M	5.4	92
T31	Common beech	26	M	7.7	185
T32	Common beech	17	M	4.7	69
T33	Common beech	25	M	6.5	132
T34	Common beech	17	M	11.2	391
T35	Common beech	24	M	10.3	335
T36	Common beech	18	M	8.3	215
T36a	Common beech	22	M	5.8	104
T36b	Hawthorn	3	M	3.1	31
T37	Common beech	26	M	10.3	335
T38	Common beech	22	EM	6.5	132
T39	Common beech	26	M	10.2	327
T40	English oak	22	EM	4.3	59
T41	Common beech	22	EM	6.1	118
T42	Common beech	15	M	10.6	350
T43	Common beech	23	EM	6	113
T44	Common beech	26	M	13.3	557
T45	Common beech	26	M	9.6	290
T46	Common beech	24	M	7.2	163
T47	Common beech	23	M	6.4	127
T48	Common beech	21	M	6.5	132
T49	Common beech	18	EM	5.9	109
T50	Downy birch	12	M	4.9	76
T51	Common beech	10	EM	4.3	59
T52	Common beech	14	M	7.7	185
T53	Common ash	8	SM	2.6	22
T54	Common beech	9	SM	3.3	35
T55	Common beech	18	M	10.3	335
T56	English oak	3	EM	3	28
T57	Common beech	15	M	9.1	261
T58	Common beech	20	M	10.7	358
T59	Common beech	21	EM	4.1	52
T60	Common beech	22	EM	5.6	100
T61	Common beech	26	M	10.6	350
T62	English oak	12	SM	3.3	35
T63	Whitebeam	12	M	9.5	282
T64	Common beech	26	M	12.5	489
T65	Common beech	24	M	12.6	499
G1	Common beech	10-26	M	8.4	222
G2	Hazel, hawthorn	4-5	M	3	28
W1	Common ash, hazel, comm	4-22	M	7.2	163
H1	Spindle, hawthorn, hazel,	3.0	EM	EM	-
H2	Hawthorn, wayfaring tree,	4.0	EM	EM	-

KEY

- Category A Tree - High quality (Retention highly desirable)
- Category A - Hedgerow, Group, Woodland - High quality (Retention highly desirable)
- Category B Tree - Moderate quality (Retention desirable)
- Category B - Hedgerow, Group, Woodland - Moderate quality (Retention desirable)
- Category C Tree - Low quality (May be retained but should not constrain development)
- Category C - Hedgerow, Group, Woodland - Low quality (May be retained but should not constrain development)
- Category U Tree - Very low quality (Mostly unsuitable for retention)
- Category U - Hedgerow, Group, Woodland - Very low quality (Mostly unsuitable for retention)
- Root Protection Area (RPA) - Layout design tool indicating the minimum area around a tree deemed to contain sufficient roots and soil volume to maintain the tree's viability
- Shrub mass/offsite tree/out of scope (OOS)

- Tree / Hedgerow / Group to be removed

Protection Measures

- Tree Protection Barrier of hazard netting (or similar) held in place with road pins or driven posts at maximum 2m intervals

N
GRID NORTH

0 5 10 15 20 25
Meters

Note: The original of this drawing was produced in colour – a monochrome copy should not be relied upon. This drawing should be interpreted with reference to the accompanying tree schedule and written advice

PROJECT TITLE
The Tunnel House, Tarlton Road, Coates

DRAWING TITLE
Tree Retention/Removal & Protection Plan

SCALE	DRAWING NUMBER
1:750 @ A3	BHA_1088_02

DRAWN BY	APPROVED BY	REVISION	SHEET	DATE
DV	IM	-	-	03/09/2021

LAYOUT USED WITHIN DRAWING **Overall Site Plan F/215 Rev.A**

CLIENT **Bathurst Estate**

COORDINATE SYSTEM / DATUM **British National Grid / Newlyn Datum (AOD)**

Barton Hyett Associates
Arboricultural Consultants
Tel: 01386 576161 Website: www.barton-hyett.co.uk
Address: Barn 2,Oxpens Farm,Yanworth,
Cheltenham,Gloucestershire,GL54 3QE

BS5837:2012 TREE SURVEY SCHEDULE

THE TUNNEL HOUSE, COATES

PROJECT NO: 4297

SURVEYOR: IAN MONGER

CLIENT: BATHURST ESTATE

SURVEY DATE: 17/03/2020

Barton Hyett Arboricultural Consultants

INDIVIDUAL TREES

Ref	Species	On / off site	Height (m)	No. of Stems	Est diam?	Calc. / Actual Stem Dia. (mm)	Crown radii (m) N-E-S-W	Avg. Canopy Height (m)	1st branch ht (m)	1st branch dir.	Life Stage	Special importance	General Observations	Health & vitality	Struct. cond.	Estimated Remaining Contribution (Years)	BS5837 Category	RPA Radius (m)	RPA m²
T1	Common beech	On	20.0	1	-	950	11.5-6.5-6.5-11.5	0.0	2	W	M	None	Low crown to west. Water pool in buttress zone.	Good	Good	40+	B1	11.4	408
T2	Common beech	On	16.0	1	-	510	8.5-6-6-4.5	2.5	2	SE	M	None	Exposed roots on informal path.	Good	Good	40+	B2	6.1	118
T3	Common beech	On	23.0	1	-	670	8.5-5-3.5-7.5	5.0	4.5	NW	M	None	Decayed branch removal wound on trunk at 2.5m	Good	Good	40+	B2	8.0	203
T4	Common beech	On	14.0	1	-	350	6-4.5-3-5	3.0	3.5	W	EM	None	Tree previously suppressed by felled ash. Squirrel damage also evident.	Good	Fair	20+	B2	4.2	55
T5	Common beech	On	25.0	1	-	510	4-6.5-4.5-7.5	5.0	2	SE	M	None	No significant visible defects.	Good	Good	40+	B2	6.1	118
T6	Elm spp.	On	11.0	1	-	250	6.6-7-1.5-4.2	3.5	5.5	N	SM	None	Trunk scuffed by forestry works.	Good	Good	40+	B2	3.0	28
T7	Common beech	On	24.0	1	-	520	8.5-8.5-1-5.5	4.0	7	NE	M	None	Historical wounds on lower trunk almost fully occluded. Asymmetrical crown.	Good	Good	40+	B2	6.2	122
T7a	Common beech	On	5.0	1	-	90	1.5-1.5-1.5-1.5	1.5	1.5	S	Y	None	Memorial tree related to canal restoration. Possibly copper beech.	Good	Good	40+	B1	1.1	4
T7b	Wych elm	On	8.5	1	-	200	6-6-2-5	3.0	4.5	N	SM	None	Second stem to north appears dead.	Good	Good	10+	C1	2.4	18
T7c	Hazel	On	7.0	2	#	220	7.5-6-2-3	1.5	2.5	NE	M	None	Asymmetrical crown.	Good	Good	40+	B2	2.6	22
T8	Common beech	On	26.0	1	-	940	12-11.5-7-8	3.0	4	E	M	None	Three stems from 4.5m. West stem has tear wound at 8m east. Recently fractured branches from felling work.	Good	Good	40+	B2	11.3	400
T9	Common beech	On	22.0	1	-	410	5-3-3.5-3	12.0	12	E	M	None	Three decayed cavities in north stem at 12m.	Good	Fair	40+	B2	4.9	76
T10	Common beech	On	22.0	1	-	680	6.5-5.5-6-7	10.0	9	S	M	None	Minor deadwood.	Good	Good	40+	B2	8.2	209

BS5837:2012 TREE SURVEY SCHEDULE

THE TUNNEL HOUSE, COATES

PROJECT NO: 4297

SURVEYOR: IAN MONGER

CLIENT: BATHURST ESTATE

SURVEY DATE: 17/03/2020

Barton Hyett Arboricultural Consultants

Ref	Species	On / off site	Height (m)	No. of Stems	Est diam?	Calc. / Actual Stem Dia. (mm)	Crown radii (m) N-E-S-W	Avg. Canopy Height (m)	1st branch ht (m)	1st branch dir.	Life Stage	Special importance	General Observations	Health & vitality	Struct. cond.	Estimated Remaining Contribution (Years)	BS5837 Category	RPA Radius (m)	RPA m²
T11	Common beech	On	20.0	1	-	600	6-0.5-5-10	3.0	2.5	W	M	None	Asymmetrical crown.	Good	Good	40+	B2	7.2	163
T12	Pine spp.	On	12.0	1	-	270	0.5-0.5-0.5-0.5	n/a	n/a	n/a	M	None	Dead, weathered stem leaning and supported by T12	Dead	Dead	<10	U	3.2	33
T13	Common beech	On	24.0	1	-	560	3.5-2-5-6	6.0	5	W	M	None	No significant visible defects.	Good	Good	40+	B2	6.7	142
T14	Common beech	On	7.0	1	-	200	2.5-1-3.5-3.5	3.0	3	SW	SM	None	Suppressed form.	Good	Good	40+	B2	2.4	18
T15	Common beech	On	24.0	1	-	390	2.5-3-2.5-3	1.0	1.5	W	M	None	Two stems from 4m.	Good	Good	40+	B2	4.7	69
T16	Common beech	On	26.0	1	-	460	2-1.5-3.5-6.5	11.0	9.5	W	M	None	No significant visible defects.	Good	Good	40+	B1	5.5	96
T17	Common beech	On	26.0	3	-	600	4.5-5-4.5-5	6.0	7	E	M	None	Three stems from near ground with water pools.	Good	Good	40+	B2	7.2	163
T18	Common beech	On	26.0	1	-	360	1.5-4.5-4.5-2	15.0	12	S	M	None	Minor bark wounds on trunk.	Good	Good	40+	B2	4.3	59
T19	Common beech	On	26.0	1	-	330	0.5-0.5-4.5-5	12.0	11	W	M	None	Suppressed form.	Good	Good	40+	B2	3.9	49
T20	Common beech	On	26.0	1	-	420	2.5-3-7-7.5	11.0	11	W	M	None	No significant visible defects.	Good	Good	40+	B2	5.0	80
T21	Common beech	On	22.0	1	-	390	4-0.5-4-8	8.0	8	W	M	None	No significant visible defects.	Good	Good	40+	B2	4.7	69
T22	Downy birch	On	14.0	1	-	260	1.5-0.5-1-7.5	13.0	10	W	M	None	No significant visible defects.	Good	Good	40+	B2	3.1	31
T23	Common beech	On	14.0	1	-	270	3-0.5-4-8	6.0	5.5	S	EM	None	No significant visible defects.	Good	Good	40+	B2	3.2	33
T24	Common beech	On	11.0	1	-	200	2.5-1-2.5-4.5	4.0	4.5	W	SM	None	No significant visible defects.	Good	Good	40+	B2	2.4	18
T25	Common beech	On	8.0	1	-	270	5.5-1.5-3-6	1.5	1	S	SM	None	Suppressed form.	Good	Good	40+	B2	3.2	33

BS5837:2012 TREE SURVEY SCHEDULE

THE TUNNEL HOUSE, COATES

PROJECT NO: 4297

SURVEYOR: IAN MONGER

CLIENT: BATHURST ESTATE

SURVEY DATE: 17/03/2020

Barton Hyett Arboricultural Consultants

Ref	Species	On / off site	Height (m)	No. of Stems	Est diam?	Calc. / Actual Stem Dia. (mm)	Crown radii (m) N-E-S-W	Avg. Canopy Height (m)	1st branch ht (m)	1st branch dir.	Life Stage	Special importance	General Observations	Health & vitality	Struct. cond.	Estimated Remaining Contribution (Years)	BS5837 Category	RPA Radius (m)	RPA m²
T26	Common beech	On	17.0	1	-	780	7-7-12-10.5	3.0	4	S	M	None	Decayed branch stub at 1m east.	Good	Good	40+	B2	9.4	275
T27	Common beech	On	25.0	1	-	720	7.5-8-10-5.5	10.0	10	E	M	None	Historical squirrel wounding on branches.	Good	Good	40+	B2	8.6	235
T28	Common beech	On	25.0	1	-	530	9-8-1.5-6	10.0	8.5	NW	M	None	Deadwood.	Good	Good	40+	B2	6.4	127
T29	Common beech	On	26.0	1	-	540	5-7-3.5-5	14.0	9.5	S	M	None	No significant visible defects.	Good	Good	40+	B2	6.5	132
T30	Common beech	On	26.0	1	-	450	2-0.5-9.5-6	8.0	6.5	S	M	None	Historical wounds on stem at 8m observed being used as nesting holes.	Good	Fair	40+	B2	5.4	92
T31	Common beech	On	26.0	1	-	640	5-6-10-6.5	10.0	5	S	M	None	Branch fractures from felling works.	Good	Good	40+	B2	7.7	185
T32	Common beech	On	17.0	1	-	390	6.5-2.5-1.5-5.5	11.0	5.5	SW	M	None	Occluding wound at primary union at 6m.	Good	Good	40+	B2	4.7	69
T33	Common beech	On	25.0	1	-	540	4.5-4-4-4	14.0	8.5	SW	M	None	Exposed surface root plate.	Good	Good	40+	B2	6.5	132
T34	Common beech	On	17.0	1	-	930	6.5-6.5-7-12	0.0	1.5	SW	M	None	Water pools in buttresses.	Good	Good	40+	B2	11.2	391
T35	Common beech	On	24.0	1	-	860	2.5-8.5-12-11.5	1.0	3	S	M	None	Included bark primary stem union at 2m.	Good	Fair	40+	B2	10.3	335
T36	Common beech	On	18.0	1	-	690	7-8.5-7.5-7.5	8.0	8	W	M	None	Branch stubs.	Good	Good	40+	B2	8.3	215
T36a	Common beech	On	22.0	1	-	480	3.5-4-5.5-6	4.0	4	SW	M	None	Included bark stem union at 2.5m.	Good	Fair	40+	B2	5.8	104
T36b	Hawthorn	On	3.0	1	-	260	1-0.5-0.5-2	1.5	1	W	M	None	Recently pollarded at 2m.	Good	Good	40+	B2	3.1	31
T37	Common beech	On	26.0	1	-	860	11-11-7-9	5.5	5.5	S	M	None	Bark scuff wounds on buttresses and exposed roots from recent felling works.	Good	Good	40+	B2	10.3	335
T38	Common beech	On	22.0	1	-	540	10-8-5-6.5	7.0	4.5	E	EM	None	Large deadwood hanger at 8m.	Good	Good	40+	B2	6.5	132

BS5837:2012 TREE SURVEY SCHEDULE

THE TUNNEL HOUSE, COATES

PROJECT NO: 4297

SURVEYOR: IAN MONGER

CLIENT: BATHURST ESTATE

SURVEY DATE: 17/03/2020

Barton Hyett Arboricultural Consultants

Ref	Species	On / off site	Height (m)	No. of Stems	Est diam?	Calc. / Actual Stem Dia. (mm)	Crown radii (m) N-E-S-W	Avg. Canopy Height (m)	1st branch ht (m)	1st branch dir.	Life Stage	Special importance	General Observations	Health & vitality	Struct. cond.	Estimated Remaining Contribution (Years)	BS5837 Category	RPA Radius (m)	RPA m²
T39	Common beech	On	26.0	1	-	850	11-11-8.5-8.5	3.5	4	W	M	None	No significant visible defects.	Good	Good	40+	B1	10.2	327
T40	English oak	On	22.0	1	-	360	3.5-1-2-4	15.0	11	N	EM	None	Attenuated stem.	Good	Good	40+	B2	4.3	59
T41	Common beech	On	22.0	1	-	510	7-4-3-6.5	4.0	3	NW	EM	None	No significant visible defects.	Good	Good	40+	B2	6.1	118
T42	Common beech	On	15.0	1	-	880	6-9-9-9	6.0	3	N	M	None	Basal shoots.	Good	Good	40+	B2	10.6	350
T43	Common beech	On	23.0	1	-	500	6.5-4-5-7	4.0	4.5	n/a	EM	None	No significant visible defects.	Good	Good	40+	B2	6.0	113
T44	Common beech	On	26.0	1	-	1110	12.5-13-7-11.5	6.0	7.5	N	M	None	Wound on trunk from 1m to 2m north with Kretzschmaria deusta fungal bodies on decaying xylem. None present at ground level. Upper crown is beginning to thin.	Fair	Fair	20+	C1	13.3	557
T45	Common beech	On	26.0	1	-	800	4-10-11-8	4.0	4	S	M	None	No significant visible defects.	Good	Good	40+	B2	9.6	290
T46	Common beech	On	24.0	2	-	600	4.5-3.5-5.5-7.5	8.0	7.5	SW	M	None	Two stems from ground. Bark scuff wounds.	Good	Good	40+	B2	7.2	163
T47	Common beech	On	23.0	1	-	530	7-10-7.5-4.5	16.0	8.5	N	M	None	Included bark stem union at 5m. Deadwood.	Good	Fair	40+	B2	6.4	127
T48	Common beech	On	21.0	1	-	540	3.5-7-8.5-5.5	4.0	4.5	S	M	None	No significant visible defects.	Good	Good	40+	B2	6.5	132
T49	Common beech	On	18.0	1	-	490	7-4.5-9-6.5	5.0	4	SW	EM	None	Bark wound on trunk at 2m adjacent to recent branch removal wound.	Good	Good	40+	B2	5.9	109
T50	Downy birch	On	12.0	1	-	410	2.5-2.5-5.5-9	5.5	3	W	M	None	No significant visible defects.	Good	Good	40+	B2	4.9	76
T51	Common beech	On	10.0	1	-	360	8-4.5-0.5-8	0.5	1.5	W	EM	None	Suppressed and contorted form. Squirrel damage on upper side of horizontal part of stem.	Good	Fair	20+	B2	4.3	59

BS5837:2012 TREE SURVEY SCHEDULE

THE TUNNEL HOUSE, COATES

PROJECT NO: 4297

SURVEYOR: IAN MONGER

CLIENT: BATHURST ESTATE

SURVEY DATE: 17/03/2020

Barton Hyett Arboricultural Consultants

Ref	Species	On / off site	Height (m)	No. of Stems	Est diam?	Calc. / Actual Stem Dia. (mm)	Crown radii (m) N-E-S-W	Avg. Canopy Height (m)	1st branch ht (m)	1st branch dir.	Life Stage	Special importance	General Observations	Health & vitality	Struct. cond.	Estimated Remaining Contribution (Years)	BS5837 Category	RPA Radius (m)	RPA m²
T52	Common beech	On	14.0	1	-	640	7.5-5.5-8-7	1.0	2	S	M	None	Historical squirrel wounds on branch at 4m and main stem at 8m.	Good	Fair	40+	B2	7.7	185
T53	Common ash	On	8.0	1	-	220	1-1.5-3-2	3.0	2.5	SW	SM	None	No significant Ash Dieback symptoms at present.	Good	Good	20+	B2	2.6	22
T54	Common beech	On	9.0	1	-	280	3-3-4.5-6.5	4.5	4	SW	SM	None	Suppressed form. Kretzschmaria deusta fungal bodies in basal stem wound.	Fair	Fair	20+	C1	3.3	35
T55	Common beech	On	18.0	3	-	860	6.5-5.5-7-6.5	2.0	1	SW	M	None	Low branching. Water pools in trunk. Low branch fracture from recent felling works.	Good	Good	40+	B2	10.3	335
T56	English oak	On	3.0	1	-	250	6.5-0.5-0.5-11	0.0	0.5	W	EM	None	Suppressed and contorted tree that grows down slope to west below hazel crowns. Exposed and decaying xylem along top of stem where stem bends abruptly at 90 degrees.	Good	Fair	40+	B2	3.0	28
T57	Common beech	On	15.0	1	-	760	10.5-4.5-9-10	0.0	0.5	N	M	None	Lower branches to west grow down slope.	Good	Good	40+	B2	9.1	261
T58	Common beech	On	20.0	2	-	890	11.5-7-7-9	4.5	1	NW	M	None	Recent crown lifting. Large low branch has water pool and decayed cavity on upper side at 2m. Deadwood.	Good	Fair	40+	B2	10.7	358
T59	Common beech	On	21.0	1	-	340	5-6.5-4-0.5	5.0	8	E	EM	None	Ash tree recently felled at base, so crown is asymmetrical.	Good	Good	40+	B2	4.1	52
T60	Common beech	On	22.0	1	-	470	4-4.5-4.5-5	6.0	6.5	E	EM	None	No significant visible defects.	Good	Good	40+	B2	5.6	100
T61	Common beech	On	26.0	1	-	880	11-11-10.5-8.5	4.5	5	S	M	None	Deadwood.	Good	Good	40+	B2	10.6	350
T62	English oak	On	12.0	1	-	280	0.5-3.5-6-2.5	8.0	8	S	SM	None	Previously suppressed tree.	Good	Good	40+	B2	3.3	35

BS5837:2012 TREE SURVEY SCHEDULE

THE TUNNEL HOUSE, COATES

PROJECT NO: 4297

SURVEYOR: IAN MONGER

CLIENT: BATHURST ESTATE

SURVEY DATE: 17/03/2020

Barton Hyett Arboricultural Consultants

Ref	Species	On / off site	Height (m)	No. of Stems	Est diam?	Calc. / Actual Stem Dia. (mm)	Crown radii (m) N-E-S-W	Avg. Canopy Height (m)	1st branch ht (m)	1st branch dir.	Life Stage	Special importance	General Observations	Health & vitality	Struct. cond.	Estimated Remaining Contribution (Years)	BS5837 Category	RPA Radius (m)	RPA m²
T63	Whitebeam	On	12.0	3	-	790	9-4-5.5-9.5	2.5	2	N	M	None	Two stems from ground. Decayed stem fracture at 6m south.	Good	Good	40+	B1	9.5	282
T64	Common beech	On	26.0	1	-	1040	8-12-11.5-10	4.0	4.5	N	M	None	Decaying trunk wound from 1.5m to 3.5m SE. Co-dominant stems from 4.5m with included bark union but major stem fusion at 8m.	Good	Fair	40+	B2	12.5	489
T65	Common beech	On	24.0	1	-	1050	7.5-8-11-13.5	8.0	2.5	S	M	None	Basal decay cavity to south-east. Residual wall and buttressing very good. Decayed large branch removal wound at 3m west under ivy.	Good	Fair	40+	B2	12.6	499

BS5837:2012 TREE SURVEY SCHEDULE

THE TUNNEL HOUSE, COATES

PROJECT NO: 4297

SURVEYOR: IAN MONGER

CLIENT: BATHURST ESTATE

SURVEY DATE: 17/03/2020

Barton Hyett Arboricultural Consultants

GROUPS OF TREES

Ref	Species	On / off site	Height range (m)	No. of trees	Est diam?	Max stem diam (mm)	Av. Crown radius (m)	Avg. Canopy Height (m)	Life Stage	Special importance	General Observations	Health & vitality	Struct. cond.	Estimated Remaining Contribution (Years)	BS5837 Category	RPA Radius (m)
G1	Common beech	On	10-26	7	-	700.0	10	4.0	M	None	Tight group with root grafting evident. Stem cavity at 1.5m on smaller tree to south-east.	Good	Good	40+	B2	8.4
G2	Hazel, hawthorn	On	4-5	14	-	250.0	3.5	1.0	M	None	Area of understorey not cleared in recent felling works.	Good	Good	40+	B2	3.0

WOODLANDS

Ref	Species	On/off site	Height range (m)	No. of trees	Est diam?	Max stem diam (mm)	Av. Crown radius (m)	Avg. low crown height (m)	Life Stage	Special importance	General Observations	Health & vitality	Structural condition	Estimated Remaining Contribution (Years)	BS5837 Category	RPA Radius (m)
W1	Common ash, hazel, common beech, hawthorn, holly, blackthorn, field maple, sycamore	On	4-22	100	#	600.0	5	0.5	M	None	Mature ash on top and west of bank, with young to semi-mature beech, and sycamore below. Ash has Inonotus hispidus decay symptoms. Area has not been cleared as part of recent works to north.	Fair	Fair	40	B2	7.2

HEDGEROWS

Ref	Species	On / off site	Av. Height (m)	Av. width (m)	Av. Stem diam (mm)	Avg. Canopy Height (m)	Life Stage	General Observations	Health & vitality	Struct. cond.	Estimated Remaining Contribution (Years)	BS5837 Category	RPA Radius (m)
H1	Spindle, hawthorn, hazel, elder, dog rose, common beech, English oak, wayfaring tree, blackthorn	On	3.0	2.5	130	0.0	EM	Partially maintained scrubby hedgerow with gaps.	Good	Fair	40	B3	1.6
H2	Hawthorn, wayfaring tree, guelder rose, hazel, dogwood, blackthorn, dog rose, elder, spindle,	On	4.0	4	130	0.0	EM	Unmaintained scrubby hedgerow	Good	Good	40	B3	1.6

SELECT IMAGES FROM THE TREE SURVEY

THE TUNNEL HOUSE, COATES

PROJECT NO: 4297

SURVEYOR: IAN MONGER

CLIENT: BATHURST ESTATE

SURVEY DATE: 17/03/2020

Barton Hyett
Arboricultural Consultants

IMAGE 1: View of the woodland belt, looking south-east from north part of th field.

IMAGE 2: View along the woodland/field edge, loongingsouth-east.

IMAGE 3: View within the woodland belt, looking south.

IMAGE 4: View showing the steep embankment along the western edge of the site, looking south.

IMAGE 5: View of the location of the proposed boardwalk access into the woodland, looking south from T7a.

IMAGE 6: View of hazel and hawthorn group G2, looking north. The group will be partially coppiced to provide views for units 3 and 4.

SECTION 4

- The tree survey was carried out with reference to the methodology set out in BS5837:2012 'Trees in relation to design, demolition and construction –Recommendations'.
- Trees were surveyed individually or as groups where it was considered that they had grown together to form cohesive arboricultural features either aerodynamically (trees that provide companion shelter), visually (e.g. avenues or screens) or culturally (including for biodiversity). However, where it was considered that there was an arboricultural need to differentiate between attributes trees within groups and / or woodlands were also surveyed as individuals.
- The full tree survey findings are recorded in the following tree survey schedule.
- Within the tree survey schedule, each surveyed TREE (T), GROUP (G), HEDGEROW (H), WOODLAND (W) or SHRUB MASS on or adjacent to the site is given a reference number which refers to its position on the tree survey and constraints plan.
- TREE SPECIES are listed by common name.

The **DIMENSIONS** taken are:

- STEM-No. Indicates the number of main stems (i.e. whether the trunk divides at or below 1.5m; (Used in the calculation of RPA.) "m-s" = Multi-stemmed.
- STEM DIAMETER (measured in millimetres), obtained from the girth measured at approx. 1.5m. For trees with 2 to 5 sub-stems a notional figure is derived from the sum of their cross-sectional areas. For multi-stemmed trees, the notional diameter may be estimated on the basis of the average stem size x the number of stems. (A notional diameter may be estimated where measurement is not possible.)
- HEIGHT (measured in metres), recorded to the nearest half metre for dimensions up to 10m and to the nearest whole metre for dimensions over 10m.
- The CROWN SPREAD, taken at the four cardinal points to derive an accurate representation of the tree crown, recorded up to the nearest half metre for dimensions up to 10m and to up the nearest whole metre for dimensions over 10m.
- CROWN CLEARANCES are expressed both as existing height above ground level of first significant branch along with its direction of growth (e.g. 2.5m-N), and also in terms of the overall crown e.g. the average height of the crown above ground level. Measurements are recorded to the nearest half metre for dimensions up to 10m and to the nearest whole metre for dimensions over 10m.
- ESTIMATES. Where any measurement has had to be estimated, due to inaccessibility for example, this is indicated by a "#" suffix to the measurement as shown in the tree survey schedule.

LIFE STAGE is defined as follows:

Y Young: Normally stake dependent, establishing trees. Should be growing fast, usually primarily increasing in height more than spread but as yet making limited impact upon the landscape.

SM Semi-mature: Established young trees, normally of good vigour and still increasing in height but beginning to spread laterally. Beginning to make an impact upon the local landscape and environment. Semi-Mature (still capable of being transplanted without preparation, up to 30cm girth and not yet sexually mature).

EM Early-mature: Not yet having reached 75% of expected mature size. Established young trees, normall good vigour and still increasing in height but beginning to spread laterally. Beginning to make an ir upon the local landscape and environment.

M Mature: Well-established trees, still growing with some vigour but tending to fill out and increase sp Bark may be beginning to crack and fissure. In the middle half of their safe, useful life expectancies.

LM Late-Mature: In full maturity but possibly beyond mature and in a state of natural decline). Still ret some vigour but any growth is slowing.

A Ancient: A tree that has passed beyond maturity and is old/aged compared with other trees of the s species. Typically having a very wide trunk and a small canopy.

PHYSIOLOGICAL CONDITION (HEALTH & VITALITY):

Essentially a snapshot of the general health of the tree based upon its general appearance, it's apparent vigour and the presence or absence of symptoms associated with poor health, physiological stress etc. (Fungal infections ma be recorded here but decay giving rise to structural weakness would be recorded under 'Structural Condition' –se next parameter):

Good: No significant health issues.

Fair: Indications of slight stress or minor disease (e.g. the presence of minor dieback/deadwoc epicormic shoot growth).

Poor: Significant stress or disease noted; larger areas of dieback than above.

Dead: (or Moribund).

STRUCTURAL CONDITION:

Defects affecting the structural stability of the tree including decay, significant dead wood, root-plate instabilit significant damage to structural roots, weak forks (e.g. those where bark is included between the members) Classified as:

Good: No obvious structural defects: basically sound.

Fair: Minor, potential or incipient defects.

Poor: Significant defect(s) likely to lead to actual failure in the medium to long-term.

Dead: (or Moribund).

ESTIMATED REMAINING CONTRIBUTION:

An estimate of the length of time in years that a tree might be expected to continue to make a useful contribu to the locality at an acceptable level of risk (based on an assumption of continued routine maintenance):

- Less than 10 years
- 10+ years
- 20+ years
- 40+ years

SPECIAL IMPORTANCE:

Trees that are particularly notable as high value trees such as ancient trees/woodland or veteran trees. Such trees may be regarded as the principal arboricultural features of a site and pose a significant constraint to potential development.

An *ancient* tree is one that has passed beyond maturity and is very old compared with other trees of the same species. Very few trees reach the ancient life-stage.

Veteran trees are often very old but not necessarily so; they may be regarded as 'survivors' that have developed some of the characteristic features of an ancient tree but have not necessarily lived as long. All ancient trees are veterans but not all veteran trees are ancient.

An ancient woodland is an area that has been wooded continuously since at least 1600 AD. It includes ancient semi-natural woodland (ASNW), plantations on ancient woodland sites (PAWS) and ancient replanted woodland (ARW)

QUALITY CATEGORY:

Trees are classed as category U, A, B or C, based on criteria given in BS5837:2012; summary definitions as follows (see BS5837 for further details). Categories A, B and C are further characterised by the use of sub-categories, which attempt to identify what aspect of the tree is the main source of its perceived value, These are:

(1) arboricultural qualities
(2) landscape qualities, and
(3) cultural, historic or ecological/conservation qualities.

Examples of these qualities for each of the three categories are given below, although these are indicative only.

Note: This is NOT a health and safety classification; the classification does not take into account any requirement for remedial tree care or ongoing maintenance apart from that which may affect the trees' general suitability for retention.

CATEGORY A: HIGH QUALITY:

Trees or groups whose retention should be given a particularly high priority within the design process. Normally with an expected useful life expectancy of at least 40 years.

A1: Notably fine specimens; rare or unusual specimens; essential component trees within groups, semi-formal or formal plantings (e.g. dominant trees within an avenue etc.).

A2: Trees, groups or woodlands of particular visual importance as landscape features.

A3: Trees, groups or woodlands of particular significance by virtue of their conservation, historical, commemorative or other value (e.g. veteran trees or wood pasture.)

CATEGORY B: MODERATE QUALITY:

Trees or groups of some importance with a likely useful life expectancy in excess of 20 years. Their retention would be desirable; selective removal of certain individuals may be acceptable but only after full consideration of all alternative courses of action.

B1: Fair quality but not exceptional; good specimens showing some impairment (e.g. remediable defects, min storm damage or poor past management.)

B2: Acceptable trees situated such as to have little visual impact within the wider locality. Also numbers of trees perhaps in groups or woodlands, whose value as landscape features is greater collectively than warrant as individuals (such that the selective removal of an individual would not impact greatly upo trees' overall, collective value).

B3: Trees, groups or woodlands with clearly identifiable conservation or other cultural benefits.

CATEGORY C: LOW QUALITY:

Trees or groups of rather low quality, although potentially capable of retention for at least approx. 10 years. Al small trees with stems below 15cm diameter.

Potentially retainable, but not of sufficient value to be regarded as a significant planning constraint.

C1: Unremarkable trees of very limited merit or of significantly impaired condition.

C2: Trees offering only low or short-term landscape benefits; also secondary specimens within g woodlands whose loss would not significantly diminish their landscape value.

C3: Trees with extremely limited conservation or other cultural benefit.

CATEGORY U:

Trees likely to prove to be unsuitable for retention for longer than 10 years should any significant increase in usage arise as a result of development.

E.g. dead or moribund trees; those at risk of collapse or in terminal decline; trees that will be left unstable by oth essential works such as the removal of nearby category U trees; trees infected by pathogens that could materia affect other trees; low quality trees that are suppressing better specimens.

(Category U trees may have conservation values that it might be desirable to preserve. This category may include trees that should be removed irrespective of any development proposals.)

ROOT PROTECTION AREA (RPA):

These are normally represented as a circle centred on the base of each tree stem with a radius of 12 times s diameter, measured at 1.5m above ground level. The shape of the RPA may be altered where site cor dictate that there are sound reasons to do so.

VETERAN OR ANCIENT TREE BUFFER (VTB/ATB)

In line with the Standing Advice produced by the Forestry Commission and Natural England this is a buffer zone (i metres) around an ancient or veteran tree that should be at least 15 times larger than the diameter of the tree. Th buffer zone should be 5m from the edge of the tree's canopy if that area is larger than 15 times the tree's diameter.

ANCIENT WOODLAND BUFFER (FOR ASNW, PAWS OR ARW)

In line with the Standing Advice produced by the Forestry Commission and Natural England this is a buffer zone a at least 15 metres to avoid root damage. Where assessment shows other impacts are likely to extend beyond t distance, a larger buffer zone may be required.

THE IMPORTANCE OF TREES

Wider benefits:

There is a growing body of evidence that trees bring a wide range of benefits to the places people live.

Some *Economic* benefits of trees include:

- Trees can increase property values
- As trees grow larger, the lift they give to property values grows proportionately
- They can improve the environmental performance of buildings by reducing heating and cooling costs, thereby cutting bills
- Mature landscapes with trees can be worth more as development sites
- Trees create a positive perception of a place for potential property buyers
- Urban trees improve the health of local populations, reducing healthcare costs

Some *Social* benefits of trees include:

- Trees help create a sense of place and local identity
- They benefit communities by increasing pride in the local area
- They can create focal points and landmarks
- They have a positive impact on people's physical and mental health
- They can have a positive impact on crime reduction

Some *Environmental* benefits of trees include:

- Urban trees reduce the 'urban heat island effect' of localised temperature extremes
- They provide shade, making streets and buildings cooler in summer
- They help remove dust and particulates from the air
- They help to reduce traffic noise by absorbing and deflecting sound
- They help to reduce wind speeds
- By providing food and shelter for wildlife, they help increase biodiversity
- They can reduce the effects of flash flooding by slowing the rate at which rainfall reaches the ground
- They can help remediate contaminated soil

On new development sites:

Trees bring many benefits to new development. Where retained successfully they can form impor and sustainable elements of green infrastructure, contribute to urban cooling and reduc demands in buildings. Their importance is acknowledged in relation to adaptation to the ef climate change. Other benefits brought by trees include:

- Increasing property values
- Visual amenity
- Softening, complementing and adding maturity to built form
- Displaying seasonal change
- Increasing wildlife opportunities in built-up areas
- Contributing to screening and shade
- Reducing wind speed and turbulence

NATIONAL PLANNING POLICY

The National Planning Policy Framework 2021 (NPPF paragraph 180) states that, when determi planning applications, local planning authorities should apply the following principle:

c) 'development resulting in the loss or deterioration of irreplaceable habitats (such as ancient woodlan and ancient or veteran trees) should be refused, unless there are wholly exceptional reasons and a suitable compensation strategy exists.'

In this respect the following definitions apply:

'Ancient woodland: An area that has been wooded continuously since at least 1600 AD. It in ancient semi-natural woodland and plantations on ancient woodland sites (PAWS)', and

'Ancient or veteran tree: A tree which, because of its age, size and condition, is of e biodiversity, cultural or heritage value. All ancient trees are veteran trees. Not all veteran trees are enough to be ancient, but are old relative to other trees of the same species. Very few trees species reach the ancient life-stage.'

Note: Further information from the National Planning Policy Guidance Suite and Standing Ad provided in the design guidance section.

Other paragraphs of the NPPF 2021 of relevance to this report are:

Paragraph 131: *'Trees make an important contribution to the character and quality of urban environments, and can also help mitigate and adapt to climate change. Planning policies and decisions should ensure that new streets are tree-lined, that opportunities are taken to incorporate trees elsewhere in developments (such as parks and community orchards), that appropriate measures are in place to secure the long-term maintenance of newly-planted trees, and that existing trees are retained wherever possible. Applicants and local planning authorities should work with highways officers and tree officers to ensure that the right trees are planted in the right places, and solutions are found that are compatible with highways standards and the needs of different users.'*

Paragraph 174: *'Planning policies and decisions should contribute to and enhance the natural and local environment by:*
b) recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services – including the economic and other benefits of the best and most versatile agricultural land, and of trees and woodland.'

STATUTORY CONTROLS

Statutory tree protection

Works to trees which are covered by Tree Preservation Orders (TPOs) or are within a Conservation Area (CA) require permission or consent from the Local Planning Authority. Where information is available on any Statutory designations such as this they are identified within the summary table in Section 1 and on the Tree Survey and Constraints Plan at Section 2.

Notwithstanding specific exceptions and in general terms, a TPO prevents the cutting down, uprooting, topping, lopping, wilful damage or wilful destruction of protected trees or woodlands without the prior written consent of the LPA.

Penalties for contravention of a TPO tend to reflect the extent of damage caused but can, in the event of a tree being destroyed, result in a fine of up to £20,000 if convicted in a Magistrates' Court, or an unlimited fine is the matter is determined by the Crown Court.

Similarly, and again notwithstanding specific exceptions, it is an offence to carry out any works to a tree in a Conservation Area with a trunk diameter greater than 75mm diameter at 1.5 height without having first provided the LPA with 6 weeks written notification of intent to carry out the works.

On many non-residential sites (excluding specific exemptions) there is also a statutory restriction relating to tree felling that relates to quantities of timber that can be removed within set time periods. In basic terms, it is an offence to remove more than 5 cubic metres of timber in any one calendar quarter witho having first obtained a felling licence from the Forestry Commission.

Any proposed tree works that are planned to be carried out on site must be carried out in accorda with the statutory controls outlined.

Statutory Wildlife Protection

Although preliminary visual checks from ground level of likely wildlife habitats are made at the tim surveying, detailed ecological assessments of wildlife habitats are not made by the arboriculturist and fal outside of the scope for this report.

Trees which contain holes, splits, cracks and cavities could potentially provide a habitat for prote species such as bats in addition to birds and small mammals. It is advised that in some in specialist ecological advice may be required. This may result in tree works being carried out following detailed climbing inspection to the tree to ensure that protected species or their nests/roosts a disturbed. If any are found, the site manager, site owner or consulting arboriculturist should be informe and appropriate action taken as recommended by the appointed Ecologist or Natural England.

It is advised that tree/hedgerow works are carried out with the understanding that birds will gen nest in trees, hedges and shrubs between March and August. This time period only pr indication of likely nesting times and as such diligence is required when undertaking tree works times.

Irrespective of the time of year and other than any actions approved under General Licence, it offence to intentionally kill, injure or take any wild bird or to intentionally take, damage or destr nest or eggs of any wild bird. Ideally, tree operations should be avoided during the likely bird ne period. However, any tree works should always only be carried out following a preliminary visual check of the vegetation.

For information, the Wildlife and Countryside Act 1981 (as amended), The Countryside and Righ Way Act 2000 (as amended) and the Conservation of Habitat and Species Regulations 2010, form basis of the statutory legislation for flora and fauna in England and Wales. A different l framework applies in Scotland and Northern Ireland.

Any proposed tree works that are planned to be carried out on site must be carried out in accorda with any relevant statutory controls, outlined above.

DESIGN GUIDANCE

Approach

The approach adopts the guidelines set out in the British Standard BS 5837:2012 Trees in relation to design, demolition and construction –Recommendations. The process is broken down to coordinate with the key elements within both the RIBA Plan of Work (2013) and British Standard 5837:2012 as set out in the table below:

Information Stage	RIBA Stage	BS5837:2012
Stage A –Tree Survey	2: Concept	4: Feasibility
Stage B –Arboricultural Impact Assessment	3: Developed design	5: Proposals
Stage C –Arboricultural Method Statement	4: Technical design	6: Technical Design
Stage D –Arboricultural Site Supervision	5: Construction	7: Demolition and construction

A hierarchical approach is adopted in order to achieve optimum use of the site and location of built structures. This is set out below:

Avoid

The starting point of Site layout design should be to avoid the RPA of retained trees and provide suitable clearance from above ground constraints [tree canopies]. Where possible building lines should be at least 2m outside the RPA to provide working space for construction. However, protection measures can be taken if such clearance is not achievable.

Mitigate

Where intrusion within the RPA is unavoidable then its impact on the tree can be mitigated by specialist measures:

Foundations that avoid trenching e.g. screw piles, suspended floor slabs or casting at ground level for lightweight structures such as bin and cycle stores.

Limited use may be made for parking, drives or hard surfaces within the root protection areas, subject to advice from a qualified arboriculturist. Cellular confinement systems that enable hard surfaces to be built above existing soil levels are acceptable methods subject to site-specific soil conditions.

Service runs that cannot be routed outside the RPA(s) can be installed by, for example, thrust bo directional drilling, air excavation or hand digging. These operations often require supervision b project arboriculturist.

Compensate

Replacement planting can ensure the continuity of tree cover where tree removal is unavoida desirable. Off-site provision may be considered in some circumstances but this will require negotia with the local planning authority.

Considerations:

For proposed residential developments, consideration must be given to numerous factors future growth and orientation.

Tree constraints

Root Protection Areas:

With reference to BS5837:2012, a root protection area (RPA) is defined as “a layout de indicating the minimum area around a tree deemed to contain sufficient roots and rooting volu maintain the tree’s viability, and where the protection of the roots and soil structure should be treated a a priority”. “**The default position [when considering design layout in relation to RPAs] shoul that structures are located outside the RPAs of trees to be retained**”.

BS5837:2012 states (4.6.2) that, “where pre-existing site conditions or other factors indicate that rootin has occurred asymmetrically, a polygon of equivalent area should be produced.” The BS goes state that, “modifications to the shape of the RPA should reflect a soundly based arb assessment of likely root distribution,” and that any deviation from the original circular plot should t into account:

- Morphology and disposition of roots;
- topography and drainage;
- soil type and structure;
- the likely tolerance of the tree to root damage/disturbance.

Additional buffer zones beyond the RPA:

The following text is taken from the Standing Advice produced by the Forestry Commission and Natu England as included in the National Planing Policy Guidance:

‘A buffer zone’s purpose is to protect ancient woodland and individual ancient or veteran trees. The size and type of buffer zone should vary depending on the scale, type and impact of the development’.

Ancient woodland buffer:

‘For ancient woodlands, you should have a buffer zone of at least 15 metres to avoid root damage. Where assessment shows other impacts are likely to extend beyond this distance, you’re likely to need a larger buffer zone. For example, the effect of air pollution from development that results in a significant increase in traffic’.

Ancient and veteran tree buffer:

‘A buffer zone around an ancient or veteran tree should be at least 15 times larger than the diameter of the tree. The buffer zone should be 5m from the edge of the tree’s canopy if that area is larger than 15 times the tree’s diameter’.

Above ground:

Above ground constraints posed by trees describe the capacity for trees to have an overbearing or dominating effect on new developments; usually post occupancy. Typical above ground constraints include a number or combination of inconveniences including shading, branch spread, movement of trees during strong winds and so on. If not adequately considered, above ground constraints can lead to repeated requests to fell or heavily prune retained and protected trees.

Shade:

Adverse shading and blocked views from windows raise concerns for incoming residents, which may lead to pressure to fell or remove trees in the future. Wherever possible it is advisable to arrange fenestration away from tree canopies to lessen the conflict, or increase window size to accommodate ambient light. Conversely, appropriate designed development can use existing or new trees to create necessary and welcome shade and screening.

As part of the adopted approach the above considerations and constraints are assessed cumulatively in order to provide clear and site-specific advice on the areas of a site most suitable for the location of development.

Dependent on the site and nature of the proposed development, the Tree Survey and Constraints Plan may show the following:

Recommended Developable area - an advisory area defined in order to minimise arboricultural impact using standard approaches to construction. Restricting proposed development to this area will limit t risk of harm to retained trees and of the Local Planning Authority objecting to t development. It may be possible to propose development outside of this area but specific ‘low impa construction techniques may be needed recommended.

Recommended Buffer to development - similar to the Recommend Developable Area but defined as line marking a suitable buffer to retained trees. More commonly used on large sites or sites where presence of trees is localised.

Tree Opportunities

Depending on the scale of developments existing trees can often provide opportunities to enhance t existing arboricultural resource of a site by bringing it into good management or by putting in remedial measures e.g. soil amelioration.

Appropriately designed new tree planting is extremely important in maintaining healthy and sustainab tree populations. For the reasons highlighted, new trees can bring many benefits to new development It is critical to the establishment of new tree planting that the locations, species and specification of ne trees is appropriate. Subsequently the sourcing of high-quality stock, suitable planting and the provisio of post planting maintenance are essential to allow new trees to establish and to allow them to mature.

Barton Hyett
Arboricultural Consultants

HOW TREE DAMAGE CAN OCCUR

Above the ground

Damage can occur as a result of knocks and scuffs, breakages of branches and/or tree trunks. This is often but not always associated with machine operations, groundworks excavations, tele handlers, high sided vehicles and crane use. Other forms of above ground damage include fixings to trunk and unauthorised cutting back of branches. Wounds will harm a tree's health and shorten its life by letting in disease-causing organisms.

Below the ground

It is often not appreciated that the majority of most tree roots are generally located within the top 600mm of the ground. On this basis it needs to be understood that damage to roots can occur in three ways:

- Root severance can occur as a result of, for example, soil stripping during site clearance or excavations.
- Root dieback and death can result from compaction of the soil. Compaction can occur as a result of vehicle weight, weight of stored materials or increased pedestrian access. Compaction crushes out soil pore space and prevents tree respiration from occurring (respiration requires gas exchange between the ground and the atmosphere). Compacted soil is denser and therefore inhibits/prevents any further new root growth.
- Pollution of the soil with chemicals such as oil or cement washings can destroy the soil environment, making it inhospitable for the tree cause causing it stress.

The effects of these impacts can be disfiguring to a tree's appearance and also weaken a tree making it more liable to attack by pest and diseases. In addition, root damage or death results in corresponding decline above the ground with dieback occurring within the tree crown.

The effects of damage to trees generally take some time to become fully apparent. In many cases, damaged trees decline slowly after the completion of a new development, until they eventually need to be removed due to ill health.

Tree protection barriers and load distributing 'no-dig' paths are specified in order to prevent soil compaction from taking place.

GENERAL SITE RULES FOR TREE PROTECTION

Do not independently carry out any activity that is at odds with the site scheme of tree protection. This is containe within an approved Arboricultural Method Statement (AMS) and accompanying Tree Protection Plan.

In simple terms: do not carry out any work within any Construction Exclusion Zone (CEZ) without prior liaison w the Project Arboriculturist and written authorisation from the Local Planning Authority.

Within the CEZ:

- No mixing of cement
- No soil/turf stripping, raising/lowering of ground levels (unless advised), deposit or excavation of soil or rubble
- No excavations for services or installation of services
- No storage of materials, machinery fuel, chemicals or other materials of any other description
- No parking/use of tracked or wheeled machinery
- No siting of temporary structures including hard standing areas, portaloos, site huts
- No lighting of fires or disposal of liquids
- Fires on site should be avoided if possible. Where they are unavoidable, they must not be lit in a position wher heat could damage foliage or branches. Fires must be a minimum of 20m from the trunk of any retained tree o the centre line of any hedgerow to be retained
- No signs, cables, fixtures or fittings of any other description shall be attached to any part of a retained tree